chairmanship of Lord Derby, the Committee being made up of members of the two Air Departments, the chairman, and Lord Montagu of Beaulieu. The Committee had no executive control in the sense desired by the two non-Service members, both of whom decided to resign their positions. As Lord Montagu indicated a lack of co-operation between the members of the two Air Departments, the resignations produced a general feeling of depression, and to those most keenly interested in the future of aeronautics it has been a relief to find the work of some of the senior members of the Services recognised by promotion. Whatever may be said as to the existing conditions, it seems certain that the extraordinary progress of aeronautics during the war would in itself have been sufficient to raise the question of an Air Board; perhaps the formation of such a Board would facilitate reorganisation. The Government being the only body able to deal with the problem with sufficient knowledge as to facts, the Prime Minister's forthcoming statement will be awaited with considerable interest.

NOTES.

The Royal Society has elected the following as foreign members:—Prince Boris Galitzin, of Petrograd, head of the Meteorological Service in Russia; Dr. C. L. A. Laveran, of Paris, discoverer (1880) of the parasite (*Laverania malariae*) the cause of malarial fever; Dr. Johan Hjort, director of Norwegian Fisheries; Prof. Jules Bordet, of the University of Brussels, eminent in bacteriology; and Prof. H. Kamerlingh Onnes, of the University of Leyden, the distinguished physicist who was responsible finally for the liquefaction of helium.

Sir Ray Lankester informs us that Prof. Metchnikoff, of the Institut Pasteur, is recovering from his serious and prolonged attack of pulmonary inflammation. He is not yet able to go into his laboratory, but is able to occupy himself with some speculative inquiries. He would be glad to know of any well-recorded instances tending to show whether the opinion that men of genius are not usually the eldest born in a family is well founded or not.

The recommendations of the Royal Commission on Venereal Diseases were dealt with in an article in Nature for April 6, and the opinion was expressed that the measures proposed by the Commissioners must be approved of without hesitation. It is satisfactory to be able to report that on April 14 Mr. Long, President of the Local Government Board, received a deputation from the National Council for Combating Venereal Diseases, which presented a petition urging the importance of giving effect to the recommendations of the Royal Commission. In his reply to the deputation, which was introduced by Lord Sydenham, Mr. Long said he had communicated with the Treasury, and it is prepared to provide the necessary grant to carry out the recommendations of the Commission with regard to the provision of facilities for diagnosis and treatment. These grants will cover 75 per cent. of the cost incurred by local authorities. It is not proposed to create special hospitals for treatment of venereal diseases, since it is thought that treatment will be carried out more efficiently at existing general hospitals.

A third article on aircraft by M. Georges Prade appears in the *Times* of April 14, and deals with the "Armament of Aeroplanes." It is becoming more and more evident as the war proceeds that the most desirable form of fighting aeroplane is a compromise between the conflicting ideal forms for high speed and convenient gun position. It appears that the practicable weapons are the rifle, machine-gun, and pom-pom, and of these the machine-gun is most frequently used. The position chosen for fighting depends on the field of fire of the machine-gun, which may be fixed relative to the aeroplane, as in the Fokker, or variable, as in most aeroplanes. The machine-gun is commonly mounted so as to fire over the tail, or through a trap-door in the flooring, and it is said that the shot which killed Pégoud was fired through a trap-door. Usually the German aeroplanes do not fire through the propeller, and, when attacking, endeavour to overtake and pass under the hostile aeroplane in order to get into a suitable firing position, but the flight manœuvres during a fight vary considerably from period to period. The Germans have succeeded in using a full belt of 250 cartridges in their machine-gun, but the Lewis gun used by British flyers is said to be the best for aeroplane attack and defence. The pom-poms, firing a small shell an inch or more in diameter, are not yet extensively used, as they call for a larger and more specially constructed aeroplane than that suitable for a machine-gun.

The issue of the *Scientific American* for March 4 is an "industrial number," dealing largely with the need for the United States to be prepared for the industrial and economic problems which will arise with the declaration of peace. The editor of our contemporary is able to publish a letter upon this subject received by him from the President of the United States. Dr. Woodrow Wilson, writing from the White House, Washington, on February 11, says: "It will be a signal service to our country to arouse it to a knowledge of the great possibilities that are open to it in the markets of the world. The door of opportunity swings wide before us. Through it we may, if we will, enter into rich fields of endeavour and success. In order to do this we must show an effectiveness in industrial practice which measures up to our best standards. We must avail ourselves of all that science can tell us in aid of industry, and must use all that education can contribute to train the artisan in the principles and practice of his work. Our industries must be self-reliant and courageous because based upon certain knowledge of their task and because supported by the efforts of citizens in the mills. If scientific research and the educated worker go hand in hand with broad vision in finance and with that keen self-criticism which is the manufacturer's first duty to himself, the fields will be few indeed in which American commerce may not hold, if it chooses, a primary place."

An Exchange Telegraph Company message from Paris, dated April 18, states that the Chamber has voted unanimously in favour of the proposal to effect daylight saving by altering the time by an hour, the object being to economise fuel and lighting.

The council of the Royal College of Surgeons has awarded the Walker prize of 100*l*. to Mr. W. S. Handley, of the Middlesex Hospital Cancer Research Laboratory, for his work in advancing the knowledge of the pathology and treatment of cancer.

The applications received for admission to Miss E. A. Browne's lecture on "Our Tropical Industries," at the Imperial Institute, on Wednesdays, have been so numerous that no further tickets for Wednesdays can be issued. It has, however, been decided to repeat the lectures on Thursdays in April, May, and

June, at 3 o'clock, commencing on April 27, and tickets for Thursdays may now be obtained at the Imperial Institute.

The annual meeting of the Marine Biological Association of the United Kingdom was held in the rooms of the Royal Society on April 12. Sir E. Ray Lankester was re-elected president, and Dr. A. E. Shipley chairman of council. The report of the council showed that a considerable amount of valuable research work was still in progress at the Plymouth Laboratory, notwithstanding the loss of staff and difficulties in collecting caused by the war. Experiments on the growth of scales of fishes under different temperature conditions are being carried on, and the regular study of the nannoplankton is continued. The laboratory continues to be used by a number of voluntary workers in addition to the members of the staff.

At the annual meeting of the Iron and Steel Institute, to be held on May 4 and 5, the following bye-law will be formally moved and voted upon:—"In the event of a state of war existing between the United Kingdom and any other country, or State, all members, honorary members, and honorary vice-presidents who shall be subjects of such enemy country, or State, shall forthwith cease to be members, honorary members, or honorary vice-presidents of the Institute, but they shall be eligible for re-election after the war in the usual manner." The acting president, Mr. Arthur Cooper, will induct into the chair the president-elect, Sir William Beardmore, Bart., and the Bessemer gold medal for 1916 will be presented to Mr. F. W. Harbord.

The death is announced of Mr. W. W. Cook, a biologist attached to the United States Department of Agriculture, and one of the leading American authorities on bird migration and distribution. In his collection of information on this subject he had especially utilised reports sent to him by lighthouse-keepers.

We regret to announce the death of Colonel A. E. Barker, professor of surgery at University College, London, and one of the most active and successful of British surgeons. He was in his sixty-sixth year, and died from inflammation of the lungs contracted while on active service abroad on April 8. Born and trained in Dublin, he was appointed assistant-surgeon to University College, London, in 1885, and became professor of surgery eight years later. In more recent years he applied himself with great success to improve the methods of obtaining anæsthesia by spinal injections, and did much to secure a safe means of administration. He improved the technique employed by surgeons in many operations, particularly in those involving operations on the abdomen and on joints. He was a fellow of the Royal College of Surgeons, England, and took an active share in the work of his adopted college and hospital.

The *British Medical Journal* gives particulars of the career of Sir Thomas B. Crosby, the first doctor of medicine to become Lord Mayor of London, who died at the age of eighty-six, on April 7. Sir Thomas studied at St. Thomas's Hospital, where he filled the appointments of house-surgeon and demonstrator of anatomy. He became F.R.C.S. Eng. in 1860, and two years later M.D. St. Andrews. He was elected Lord Mayor in 1911, being then in his eighty-second year, and it was noted that he was not only the first doctor of medicine but the oldest citizen to receive that office. He attended, as Lord Mayor, at the funeral of Lord Lister on February 16, 1912, at Westminster Abbey, following the pall-bearers in company with the Lord Provost of Edinburgh. He was at one time president of the Hunterian Society, before which he delivered, in 1871, the annual oration on "Modern Medicine"; he was also a member of the Senate of the University of London. He received several foreign Orders, including that of the Legion of Honour of France, of the Crown of Russia, St. Olaf of Norway, Danebrog of Denmark, and the Rising Sun of Japan.

By the death of M. Léon Labbé, full of honours and of years, France has lost one more of the Old Guard, the physicians and surgeons who were already in practice when Pasteur and Lister were young. It is just forty years since Labbé's "wonderful case," in 1876, of the successful removal of a fork from the stomach of a young man who had been playing tricks with that implement. The case got into the papers; Mr. Andrew Lang, in a delightful article in the *Daily News,* quoted Horace, "Naturam expellas furcâ," and observed that the surgeon, being unable to expel the fork by nature, had to call in the aid of its brother, the knife. But the point of the case is that it advanced the surgery of the stomach, especially the relief of patients with obstruction of the œsophagus by the introduction of food straight into the stomach through a narrow tube. For half a century Labbé practised and taught surgery in Paris, and his renown was great and well deserved. It was he, also, who in 1914 helped to bring about the law by which the protective treatment against typhoid fever is compulsory in the French Army. At the time of his death he was working hard in Paris for the French Army Medical Service. The honours of his profession came to him: he was president of the Société de Chirurgie in 1882; he was a member of the Académie de Médecine, and Commander of the Legion of Honour. He was a great French gentleman, handsome in face and in soul, and it seems a pity that he did not live to see France set free, and the dragon under her feet.

We record with regret the death, at Southsea, on March 30, of Dr. J. T. Leon, from cerebro-spinal meningitis, contracted from a military patient under his care. From an obituary notice in the *Lancet* we learn that Dr. Leon, who was fifty years of age, started his scientific career with the intention of being a chemist, and after leaving Clifton went to Germany. Later he entered at Unversity College, London, where he was Tufnell scholar in 1885. Two years afterwards he graduated as B.Sc. Lond., and in 1890 was appointed assistant lecturer on physics and demonstrator of chemistry in St. Mary's Hospital Medical School. After holding those appointments for three years, he commenced his medical studies at St. Mary's, where he had a successful career, graduating as M.B. Lond. in 1896, and D.P.H. Camb. in the following year. After qualifying he was appointed on plague duty in India, where he did useful work in collaboration with Prof. Haffkine. He served throughout the South African War, and upon his return settled in practice at Southsea. On the outbreak of the present war he was mobilised as captain in the Royal Army Medical Corps (T.), and was appointed sanitary specialist officer for Portsmouth. His duties involved the inspection of the sanitation of the various camps in Hampshire, and the carrying out of the bacteriological work in connection with the various epidemics that arose. He worked assiduously at these posts, and there is no doubt that his death was due to his unsparing devotion to duty.

The announcement of the death of Mr. J. H. Collins, F.G.S., on April 12, at the age of seventy-five, will be received with deep and sincere regret by a wide circle of friends, including nearly every person in Cornwall, where he was such a well-known and picturesque figure. He was a past president and honorary member of many learned and scientific societies, including the Institution of Mining and Metallurgy, of which he was also one of the founders; the Royal Geological Society of Cornwall; the Royal Cornwall Polytechnic Society; and the Royal Cornwall Institution. He was also an honorary member of the Imperial Mineralogical Society of Petrograd. For his scientific work he received the Henwood medal from the Royal Institution of Cornwall in 1893, and the Bolitho medal from the Royal Geological Society in Cornwall in 1898. He was the author of many very valuable works, all of which are regarded as classics on his special subject, including "Observations on the West of England Mining Regions," "The Hensbarrow Granite District," "Handbook of the Mineralogy of Cornwall and Devon," "Cornish Tin Stones and Tin Capels," "Origin and Development of Ore Deposits of the West of England," translation of M. Léon Moissenet's "Rich Parts of the Lodes of Cornwall," text-books on mineralogy for elementary and advanced students, and many others. He was chief chemist and metallurgist to the Rio Tinto Copper Mining Company for a period of more than twelve years, and latterly was chairman and managing director of the Wheal Kitty and Penhalls United Limited Tin Mines of Cornwall, and a director of the East Pool and Agar Mines, Ltd. For nearly half a century Mr. Collins devoted himself to a close study of the geology, mineralogy, chemistry, and metallurgy of the mines and mineral deposits of Cornwall; and it may be truly said that his knowledge of this special subject was unique. His death has left a gap in Cornwall which cannot easily be filled.

Some years ago Prof. Richard A. J. Berry, of the University of Melbourne, rendered anthropologists a great service by publishing exact tracings of all the Tasmanian skulls he could find in Australian collections. In conjunction with Dr. A. W. D. Robertson he has now issued (Transactions of the Royal Society of Victora, vol. vi., 1914) an atlas of tracings of ninety crania of Australian aborigines. Each tracing is reproduced in natural size, three views being given of each skull. In a brief preface to this atlas of cranial tracings, we learn that the Commonwealth Government is awakening to the scientific value of the skeletal remains of its native races, and is to take steps to prevent the exportation of osteological material from Australia.

The Journal of the Buteshire Natural History Society, vol. viii. (1914–15) is largely devoted to local antiquities. Dr. J. N. Marshall and Mr. J. Ritchie describe excavations at the fort and cave at Dunagoil, the peninsula at the southern end of the island of Bute. The cave, which was hollowed out by sea action, was obviously, like the fort, occupied in ancient times. The mammalian bones found included those of the wild cat (*Felis sylvestris*), the fox, wild boar, red and roe deer, the short-horned Celtic ox, and turbary sheep, the two last having been apparently domesticated. The animal remains as a whole would be sufficient to indicate that the cave-men belonged to a period not earlier than that of the predominantly round-headed Neolithic people. The absence of remains of the horse suggests that this animal, so common in Romano-British deposits, had not yet reached Bute, if indeed it had been introduced to Scotland at the time when the Dunagoil cave was inhabited. The most interesting remains of human occupation are bone and horn implements, stone pounders, and the spinning-whorl, while a piece of sheet bronze proves that after the disappearance of the earlier tenants the cave was occupied in the Bronze age. The report, which is well illustrated with plates of the discoveries, is a good example of the excellent work which can be done by a local society, the membership of which includes competent archæologists.

The annual report of the Public Health Committee of the London County Council for 1914 has just been issued. It contains the reports of the county medical officer (Dr. Hamer) and school medical officer, and details of public health administration, main drainage, and housing of the working classes. The report is illustrated with a number of diagrams of statistical data. One of these shows the seasonal prevalence of body-vermin (bugs, fleas, and lice), and it is of interest that the seasonal prevalence of scarlet fever coincides with that of fleas. Whether this is merely a coincidence or no, further study alone can elucidate. The death-rate is slightly above that for 1913, and scarlet fever, diphtheria, typhoid fever, and erysipelas all show some increase of prevalence compared with preceding years. The marriage-rate attained the comparatively high level of 19·2, but the birth-rate again showed a diminution.

In the *Psychological Review* (vol. xxiii., No. 2) Mr. J. B. Watson describes a means whereby a wide range of experiments can be performed on the conditioned reflex. The author claims that the method can be immediately applied to the study of many sensory problems, such as sensitivity to temperature and contact, fineness of localisation, differential sensitivity to pitch, etc., in animals, whether wild or domesticated, of any size, and in man also, and that the record is made in complete and permanent form by the animal itself. Students of animals, whether from the physiological or the psychological point of view, will find the article both interesting and suggestive.

The growing interest in problems of psychology, and in particular in the experimental treatment of such problems, is plainly indicated by the appearance of the first number of the *Journal of Experimental Psychology*, published under the auspices of the *Psychological Review* Company. An interesting article, entitled "A Preliminary Study of Tonal Volume," will appeal to both physicists and physiologists. There has been much divergence of opinion as to whether extensity is really an attribute of tonal sensations or merely a question of association, low tones being associated to large instruments and to gross movements of the throat. As a result of a careful investigation G. J. Rich comes to the conclusion that if we accept independent variability as the criterion of an attribute, there is evidence for the differentiation of pitch and tonal extensity, judgments of tonal volume being made with as great consistency as is usual for attributive judgments.

Sir F. J. Jackson describes, in the Journal of the East Africa and Uganda Natural History Society (vol v., No. 9), two nests of the African lung-fish (*Protopterus ethiopicus*). They were situated in a patch of coarse grass, were circular in shape, with a diameter of two and a half to three feet, and about eighteen inches in depth. But the most remarkable feature of these nests lay in the outer ring of mud, which was raised about an inch above the water-level and about five inches width. It had the appearance of being the work of a man rather than of a fish. The mud did not seem to have been pushed up from below, but rather to have been deposited from above, and then smoothed down, the surface being smooth and shiny. He suggests that this mud was brought to the surface in the mouths of the builders, and then beaten down by means of the flattened, slimy, eel-like tails.

Much attention has been paid in America to prevention of damage by frost to fruit and vegetable crops. The methods are based either on the prevention of low temperatures, or the protection of frosted plants from too rapid warming. The *Geographical Review* for February, 1916 (vol. i., No. 2), contains an illustrated article on the subject. Low temperatures are prevented by small fires, oil-pots (Fig. 1), steam pipes, or even by hot water in irrigation ditches. Apparently no method to utilise electrical energy has yet been devised. To reduce loss of heat by radiation, artificial clouds are caused by fires of wet straw, but lath screens are most effective, though too expensive as a rule. Mixing the air by some mechanical means to prevent ground frost on clear, calm nights would be useful, but no practicable method has been discovered. Rapid warming or "defrosting" is prevented by the same means used to check radiation, and also by spraying the plants with water at about 32° F. just before sunrise. This coats the plant with ice, which must be melted before warming can begin. As a result, warming is said to be gradual. All these, and other methods, are, of course, intimately associated with accurate weather forecasts, since the preventive measures are too elaborate and expensive to be employed unless required.

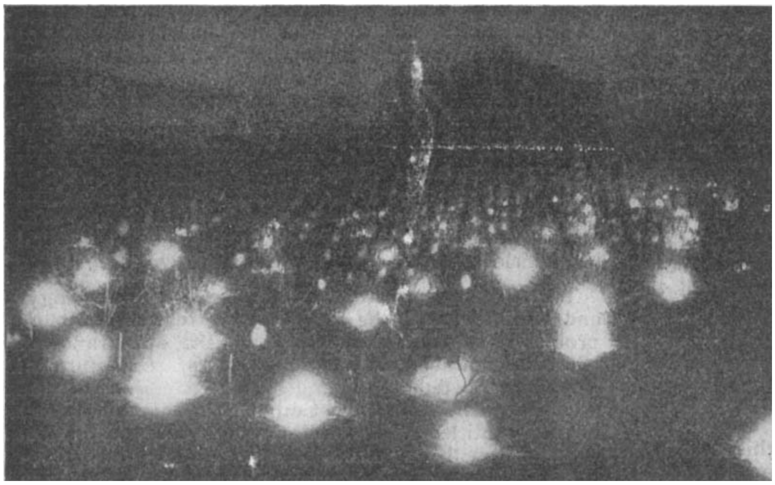

Photo. *F. E. Dean.*

Fig. 1.—Oil pots in operation in an orchard at Grand Junction, Colorado. The oil pots hold seven gallons each and burn crude oil in amounts depending on the heat required.

A summary of temperature, rainfall, and duration of bright sunshine in the United Kingdom for the first quarter of the current year, comprised in the thirteen weeks from January 2 to April 1, 1916, has been issued by the Meteorological Office The mean temperature for the period was in excess of the average in all districts, except the south of Ireland, where it was normal; the greatest excess was 1·6° in the east of England. The absolute maximum temperature ranged from 53° in the north of Scotland to 65° in the east of Scotland, and the thermometer failed to touch 60° in several districts, including the south-east and south-west of England. Rainfall was in excess of the average in all districts over Great Britain, except the west of Scotland, and there was a deficiency of rain in Ireland. The greatest excess was 177 per cent. of the average in the east of England, while in the south-east of England the fall was 161 per cent. of the average, and 160 in the Midland counties. In the east of Scotland the rainfall was 141 per cent. of the average, while in the west of Scotland the fall was only 88 per cent. In the north and south of Ireland the fall was respectively 93 and 92 per cent. of the average. The rain-days were everywhere in excess of the normal, the number in the period ranging from 72 in the south of Ireland and 71 in the north of Scotland to 56 in the north-east of England and in the Midland counties The duration of bright sunshine was generally deficient. The exceptional warmth of January and the heavy rains of February and March would considerably influence the quarter's results.

Mr. P. W. Stuart-Menteath has forwarded to us a group of pamphlets on the results of his long-continued investigations into the geological structure of the Pyrenees. They have appeared in the *Biarritz-Association*, and are entitled "Sur les Gisements Metallifères des Pyrénées Occidentales," because the interpretation of that structure greatly depends on the geological age of certain metalliferous (chiefly iron) deposits, in regard to which he differs widely from some members of the French Geological Survey. The question is too long and intricate to be dealt with in a short note, so that it must suffice to say that the map in one of the pamphlets, which represents his own views and recalls certain parts of the Alps, has a very reasonable aspect, and that he is opposed to a school of geologists in France who make greater demands on flat-folding and overthrusting than some who have studied that chain are willing to admit. His criticisms chiefly relate to the Survey map of the Mauléon Pyrenees, which is contradictory to his own observations; and these, as experience has taught him, are likely to be ignored, and if possible suppressed. He taxes its authors with misplacing sedimentary and intrusive rocks, confusing Cretaceous and Upper Palæozoic deposits, transforming typical Cenomanian and Trias into Silurian and Carboniferous, and transferring great slices of sedimentary strata from the southern to the northern side of the chain. If the charges which he brings against MM. Bertrand, Termier, and Carez be accepted, we must suppose that French geology is suffering from the incubus of official infallibility not less seriously than did British geology some five-and-thirty years ago.

Although in the last seven years there have been more than a dozen determinations of the constant of complete radiation, the results obtained have differed so widely that it has not been possible to fix on a definite value. Some of the differences may be accounted for by the radiators or the absorbing surfaces of the measuring instruments not being perfectly black, or by the neglect of the absorption of the radiation by the water vapour present in the air. Or it may be due to the form of measuring instrument adopted, and in this connection it is worth noting that when the radiation has been measured by a thermometric method, the result has in general been high, while the pyrheliometer has given mean results in fair accord with each other. In Scientific Paper No. 262 of the Bureau of Standards of Washington Mr. W. W. Coblentz reviews the work which has been done by his predecessors and recently by himself on the subject and comes to the conclusion that the most probable value of the constant is $5\cdot75\times10^{-12}$ watt cm.$^{-1}$ degree^{-4}.

The composition of the exhaust from liquid-fuel engines has been studied by Mr. R. W. Fenning, who presented a paper on the subject to the Institution of Mechanical Engineers on March 17. Various fuels were employed, the considerations affecting their choice being volatility, purity, and general suitability for use as motor spirit; hexane and benzene were taken as standard, high-grade petrol and benzol as commercial fuels. Mixtures with air were exploded in a small glass vessel, and a complete chemical analysis was made of the products. Exhaust samples were also taken from an engine fitted with Dr. Watson's apparatus for measuring air and fuel, and these samples were analysed In each case a set of curves was plotted, taking as abscissæ ratios of the fuel to air by weight, and as ordinates percentages of each of the products of combustion in turn. Such a set of curves is termed an exhaust-gas chart. The author concludes that with volatile fuels there is little difference in the composition of the products of combustion from air-fuel mixtures in a small explosion vessel or in an engine cylinder in spite of the conditions being so dissimilar. Another conclusion is that a very small quantity, if any, of unsaturated or saturated hydrocarbons is present in engine-exhaust gases; this statement is, of course, based upon the results obtained in gas analysis by the method adopted and described.

An important paper by Dr. C. H. Desch, on "The Decay of Metals," is included in a recent issue of the Transactions of the Institution of Engineers and Shipbuilders in Scotland (vol. lix., part 5). Three chief types of decay are considered. The first is that due to allotropic change, of which the "tin pest," studied by Prof. Cohen, of Utrecht, is the most notable example; similar disintegration may, however, occur in certain light aluminium alloys, which are liable to fall to powder as a result of internal molecular change, though fortunately this does not occur with any of the alloys in common use. Disintegration may also occur as a result of internal strain set up by hard working. Thus drawn rods are in a state of severe tension in the outer layers, and in compression in the inner layers, whilst in rolled or hammered rod this distribution of stresses is reversed. The fracture of the strained metal may be accelerated by corroding agents, which in some cases cause it to crack with almost explosive violence, as when very hard-drawn rods of brass or bronze are touched with a solution of a mercury salt or of ferric chloride. Finally, metals may decay as a result of actual corrosion, as in the "graphitisation" of iron pipes, from which all the ferrite is removed, leaving a soft residue of cementite, phosphide, and graphite. All these different types of decay are illustrated by photographs, the excellence of which has become almost a commonplace feature in the work of the author.

Mr. Wm. Shackleton, assistant inspector of scientific supplies at the India Store depôt, writes to direct attention to the numerals designed by his predecessor, Col. A. Strange, F.R.S., in the early 'seventies. These are still used on surveying instruments of to-day. Mr. A. P. Trotter is a nephew of Col. Strange. He illustrated these numerals in the Journal of the Institution of Electrical Engineers for February 1, gave details of their dimensions, and used them as a basis for his attempt to design an improved set (see Nature, February 24, p. 714, and April 6, p. 121).

OUR ASTRONOMICAL COLUMN.

Comet 1916*a* (Neujmin).—The following elliptic orbit has been derived by collaborators in the Berkeley Astronomical Department (Lick Observatory Bulletin, No. 280) from observations on February 29 (Yerkes), March 8 (Bamberg), and March 7 (Lick):—

$T=$ March $11\cdot2195$ G.M.T. $P=5\cdot186$ years. $\mu=684\cdot14''$
$\omega=193^\circ\ 44\cdot1'$. $e=0\cdot55465$.
$\Omega=327^\circ\ 38\cdot8'$. (whence $\phi=33^\circ\ 41'\ 11\cdot8''$.
$i=10^\circ\ 29\cdot6'$. $\log a=0\cdot47658$).

The resulting ephemeris diverges in R.A. from that calculated at Copenhagen; thus interpolation for April 20 gives α 10h. 3m. 58s., and $\delta-7^\circ\ 38\cdot0'$; the Copenhagen position being α 10h. 2m. 41s., and $\delta-7^\circ\ 34\cdot0'$. The comet was observed at the Hill Observatory, Sidmouth, on April 8. It was then very diffuse and faint, in approx. position at 9h. 27·1m. G.M.T., $\alpha=$9h. 39m. 51s., $\delta=-3^\circ\ 54\cdot9'$, very nearly midway in Right Ascension between the positions given by the two ephemerides.

Solar Radiation.—Mr. R. S. Whipple's paper on instruments for the measurement of solar radiation, read before the Optical Society of London on March 11, contains an account of all the most important forms of instrument, from the Campbell sunshine recorder and the black bulb *in vacuo*, to the registering standard water flow pyrheliometer of the Smithsonian Institution. Of these instruments the Campbell sunshine recorder still holds its own as one of the most accurate means of measuring the duration of sunshine, while the black bulb *in vacuo*, the readings of which have been recorded so many million times by patient observers, is now thoroughly discredited. At the International Meteorological Congress in 1905 the Ångström pyrheliometer was adopted as the standard instrument for the measurement of the intensity of solar radiation. In this instrument one of two similar metal strips is heated by the radiation to be measured, the other by an electric current sent through it. Equality of heating is secured by two thermo-junctions behind the strips, the necessary heating current is read, and the rate of supply of energy calculated. According to the most trustworthy measurements made under conditions more favourable to accurate observation than our climate permits, the earth receives from the sun, on the average, 0·032 calories per square centimetre per second.

Proper Motion of the Orion Nebula.—M. J. Comas Solà has obtained direct evidence that the annual proper motion of the great nebula is about 0·025″ by stereoscopic comparison of photographs. The near by small nebula, A.G.C. 1977, shows equal motion, but in the opposite direction, and it is considered to be in orbital relation with the first.

The System of λ Tauri.—Prof. F. Schlesinger has found that λ Tauri most probably involves three main bodies, only one being bright enough to yield a spectrum (Publications, Allegheny Observatory, iii., 20). Partial eclipses at intervals of four days result from the revolution of a less massive satellite, whence also arises the chief oscillation of the spectrum lines, but a second more remote and smaller body betrays its existence and period of 34·6 days in a superposed secondary oscillation revealed by the residuals. The respective masses are largely conjectural; on certain assumptions they would be 2·5, 1·0, and 0·4 solar, and the distances from the centroid of the first two 3·2, 8·0, and 50·0 millions of kilometres. The great range of velocity (56·18 km.) found by Prof. Schlesinger, asso-